# POULTRY KEEPING

IN

# *Back Yards*

U. S. DEPARTMENT *of* AGRICULTURE

FARMERS' BULLETIN NO. 1508

THEIR relatively small size and adaptability to a variety of conditions make it possible to keep poultry in the back yards of suburban and town residences.

By keeping a back-yard poultry flock, the family is supplied with eggs and poultry meat of a quality and freshness sometimes difficult to obtain. The eggs and the poultry meat are desirable sources of food of animal origin. A small flock of chickens will consume waste products from the kitchen and the garden, which helps to reduce the feed cost.

This bulletin discusses such subjects as suitable breeds, houses, methods of feeding, and sanitary requirements. Persons who desire information on other branches of the poultry industry should write to the Department, stating the subjects in which they are interested.

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# POULTRY KEEPING IN BACK YARDS

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## PURPOSE OF A BACK-YARD POULTRY FLOCK

THE back-yard flock is kept primarily for egg production and should provide the table with fresh eggs during most of the year, and, at certain seasons, furnish chickens to eat. A small home flock makes an interesting and desirable hobby, especially for those who work indoors. It involves little cash outlay, and the home provides a market for the products. The keeping of fowls serves a good purpose in utilizing various products which might otherwise be wasted. Droppings and litter from the poultry house provide a desirable fertilizer for the garden and lawn.

The keeping of chickens is adapted for villages and for the suburbs of towns and small cities. However, many cities and large towns have ordinances against keeping chickens. Hens may be kept for egg production without having a male bird in the flock, thus eliminating the objectionable morning crowing of the roosters.

## MAKING A START

A start may be made in back-yard poultry keeping by purchasing hatchery eggs, day-old chicks, started chicks, and partly grown or well-developed pullets. Ordinarily the two latter methods are preferred because it is not usually convenient for the city dweller to hatch eggs or raise chicks. If one intends to buy day-old chicks they should be obtained early in the year, preferably in March or April. Late-hatched chicks rarely, if ever, do so well as the early-hatched ones. Whether day-old chicks, pullets, or adult birds are to be purchased, it is advisable to obtain them from a reliable breeder who is known to have healthy stock bred for high egg production. From 8 to 15 birds should be sufficient to provide the average family with a liberal supply of eggs for most of the year. When it is practical to sell eggs to neigh-

[1] M. A. Jull, the senior author of the former edition of this bulletin, resigned from the Bureau in 1936.

bors—which is done in many cases—25 or more birds may be kept to advantage. Most back-yard poultry keepers sell some surplus eggs and chickens, and many families find this a good source of extra revenue.

## SELECTION OF STOCK

The more common breeds of chickens are suitable for a back-yard flock kept primarily for egg and meat production. These breeds include among others the Plymouth Rocks (fig. 1), Rhode Island Reds (fig. 2), Wyandottes (fig. 3), New Hampshires, and Leghorns (fig. 4).

30836–B

FIGURE 1.—A Barred Plymouth Rock hen that laid 288 eggs in her pullet year. The Plymouth Rock is a popular general-purpose breed.

There are many other breeds that are kept to some extent in small flocks. The first four breeds are popularly known as general-purpose breeds; they lay brown eggs and are especially suitable for back yards. If bred for high egg production, they lay well and also make good table poultry. The Leghorn belongs to the Mediterranean class, produces white eggs, and while it is a good egg-laying breed, it is not a good meat producer and is more difficult to confine. If the eggs are not used for hatching it is not necessary to keep a male bird in the flock.

When eggs for hatching are desired, only the most vigorous and best-grown birds should be used. Yearling hens usually make better breeders than pullets, but cockerels generally give better fertility than yearling or 2-year-old birds. In the light breeds, such as the Leg-

horns, one male is usually mated to 15 to 20 females. In the general-purpose breeds, such as the Plymouth Rocks, one male should be provided for every 12 to 15 females.

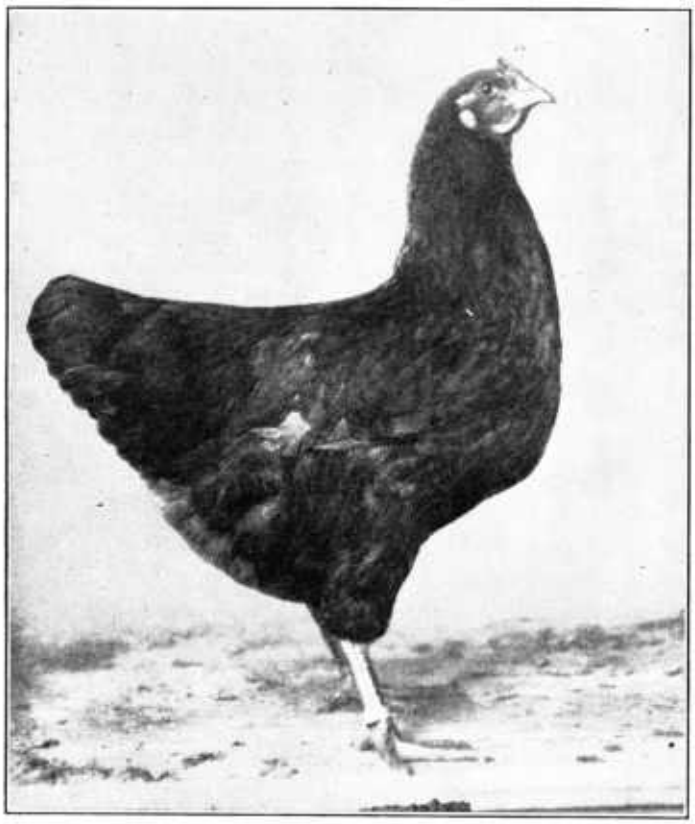

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FIGURE 2.—Single-Comb Rhode Island Red female. This is one of the most popular general-purpose breeds for egg and meat production.

## INCUBATION AND BROODING

Both the natural and the artificial methods are used in hatching and brooding chicks in small flocks. For a few chicks the natural method is the easiest and least expensive. The sale of day-old chicks from hatcheries has largely done away with small incubators for back-yard flocks. The Department has published a bulletin on "Incubation and Brooding of Chickens" (Farmers' Bulletin 1538), and these subjects will be discussed, therefore, only very briefly in the present bulletin.

### NATURAL INCUBATION AND BROODING

The broody hen (fig. 5), is usually set on a straw nest placed in a box about 18 inches square. Thirteen to fifteen eggs are put in the nest, which should be located where the hen will not be disturbed. Sitting hens should be well fed on grain and mash.

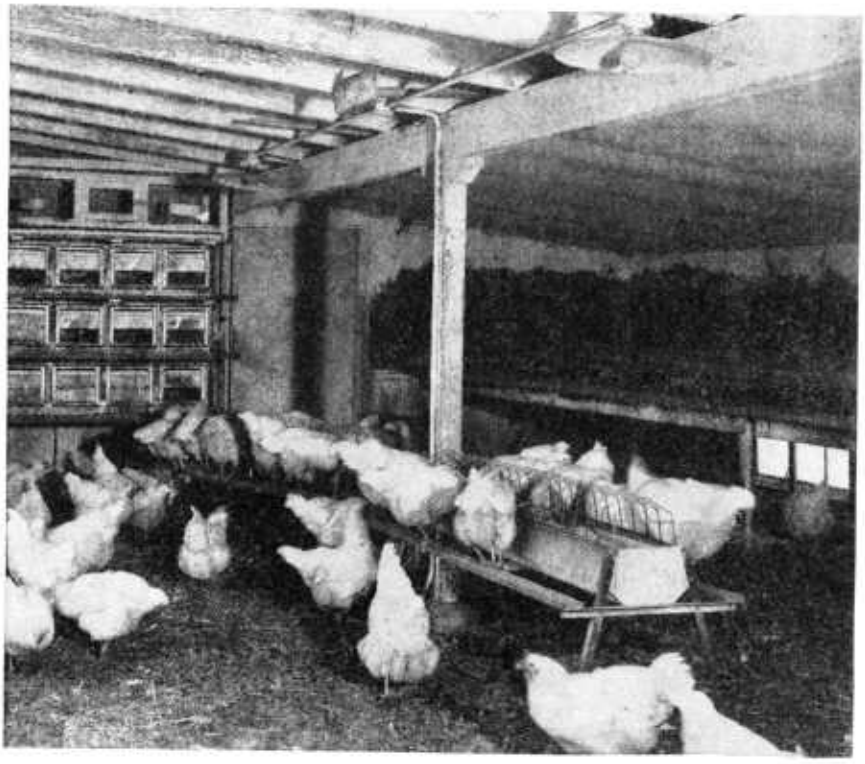

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FIGURE 3.—A flock of White Wyandottes.

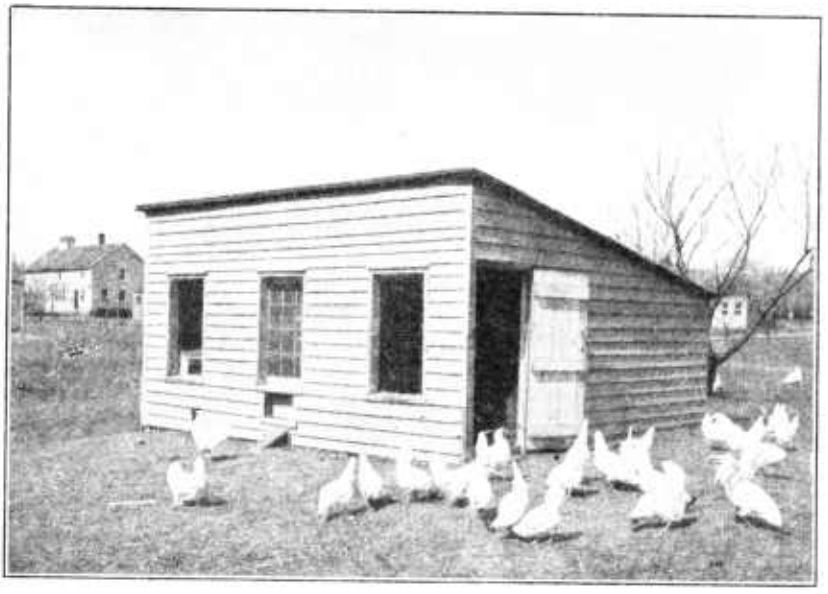

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FIGURE 4.—A flock of Single-Comb White Leghorns is good for egg production, but the hens are more apt to fly over fences than those of the heavier breeds.

Chicks should be removed from the nest to the brood coop about 24 hours after they are hatched. If the weather is cold 12 chicks are enough for a hen, while in warm weather a hen can care for 15 or more chicks. A box coop (fig. 6) makes a good brood coop, but the simplest type is the common A-shaped coop. Second-hand packing boxes may easily be made over for brood coops. A small, covered run can be made for each coop and is especially desirable where there is danger of losses from cats, hawks, or other pests.

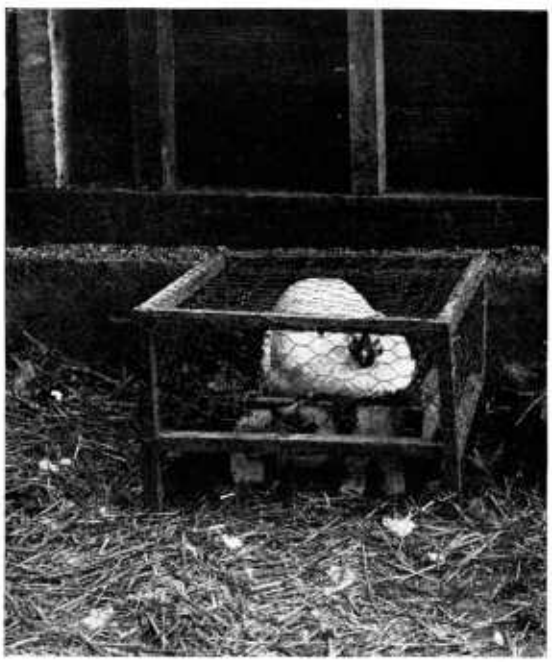

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FIGURE 5.—An inexpensive nest for a sitting hen. The wire cover protects the hen and keeps her from leaving the nest.

## BUYING DAY-OLD CHICKS

Many small-flock owners depend on the purchase of day-old chicks for starting or reproducing their flocks. Since the cost of the chick is such a small part of the value of the mature pullet, it pays to use only good-quality chicks. Day-old chicks of the highest quality are produced in hatcheries which use breeding flocks that are of high-producing stock and are rigidly selected. Many hatchery flocks are tested for pullorum disease and the chicks sold as pullorum-tested chicks.

## ARTIFICIAL BROODING

The brooder should be started at about 95° F. (fig. 7), and be ready before the chicks are received. This temperature should be reduced about 3½° F. a week until the temperature is about 70°. It is very important to train the chicks to the use of the hover for the first day or two. An enclosure of wire netting is used to keep the chicks close to the brooder (fig. 8). Chicks usually need artificial heat for 4 to 8 weeks, depending on the outside temperature and when the chicks are hatched.

Cleanliness is essential, and the brooder house should be cleaned frequently. The floors should be covered with clean dry litter or sand to absorb the moisture of the droppings. Sheets of newspapers,

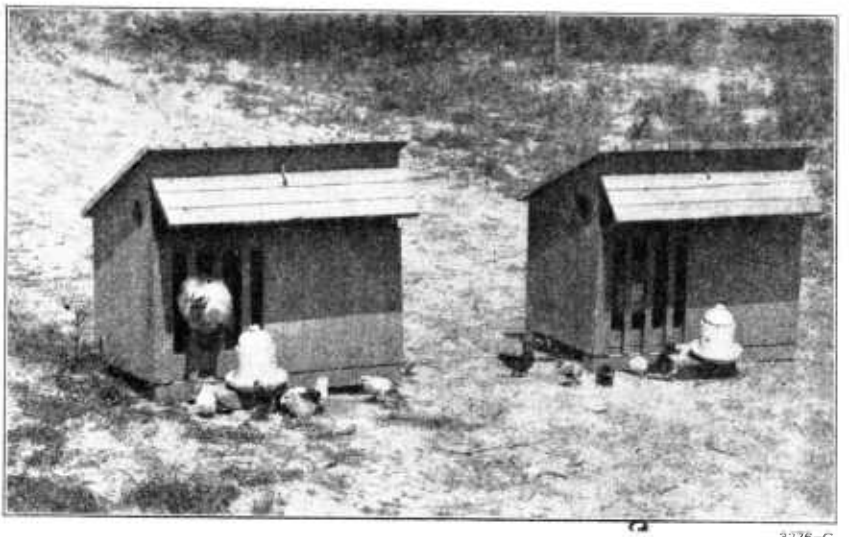

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FIGURE 6.—Well-made brood coops for confining the mother hens.

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FIGURE 7.—These baby chicks have just been received and are being put under the electric brooder.

which are changed daily, may be used under and around the hover in place of litter for the first few days.

The first rule for getting a good profit from poultry is to have high-quality chicks that are hatched early, and the next is to keep them growing so that they will reach laying maturity before the beginning of cold weather. Sexed pullet chicks can be obtained, thus eliminat-

ing nearly all the cockerels. In many cases it may be more practical to buy started pullets in the summer or well-matured pullets in the fall rather than to raise any baby chicks. Early hatched pullets should be obtained in order to get eggs in the fall and in the early part of the winter. Young chickens should be raised apart from the

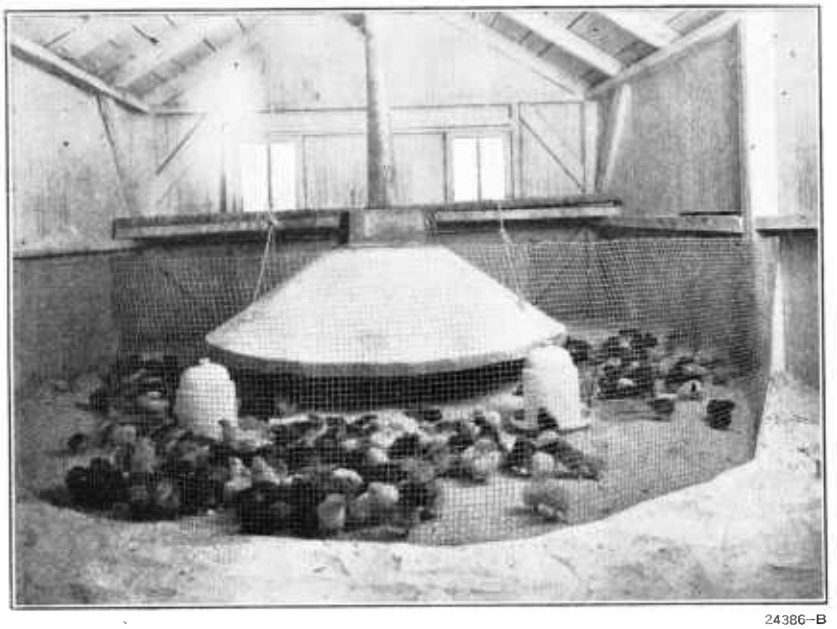

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FIGURE 8.—A coal-stove brooder with a brood of chicks. This type of brooder is well adapted for brooding chicks in flocks of from 150 to 350.

old stock and kept on clean land; otherwise the chicks are likely to contract disease from contaminated soil or to become infested with worms. Very small bare yards soon become contaminated. Under such conditions the chickens may do better if they are raised

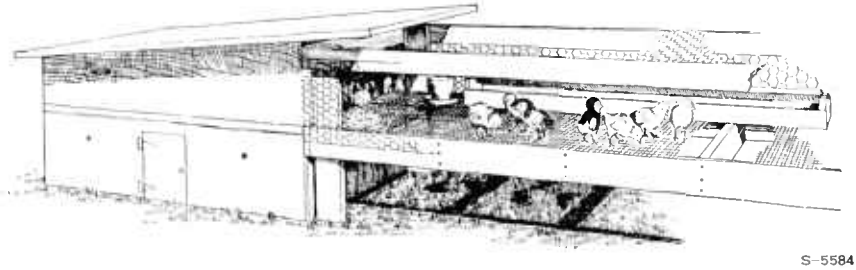

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FIGURE 9.—Home-made lamp brooder and pen with outside wire sun porch for brooding chicks.

in the house with an outside wire-floored sun porch (figs. 9 and 10). This keeps the chickens entirely off the ground. Picking or cannibalism is likely to develop when chickens are confined if they are crowded or are not given close attention. Young chickens should be kept in separate pens away from the laying hens.

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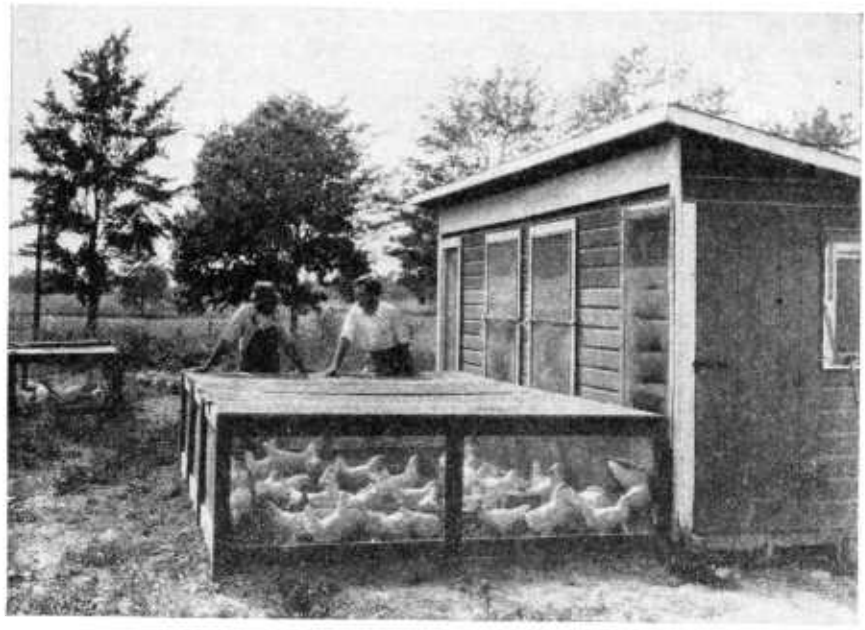

FIGURE 10.—A brooder house with a wire-floored sun porch.

## FEEDING CHICKS

Most back-yard poultry keepers find it more practical to use commercially mixed feeds rather than to buy the ingredients and mix their own feed. Many of these commercially mixed feeds are of excellent quality. For persons who desire to prepare their feeds the following formulas, taken from Farmers' Bulletin No. 1841, "The Feeding of Chickens," are suggested.

STARTING AND GROWING MASH

| *Ingredient* | *Parts, by weight* |
|---|---|
| Ground yellow corn | 21. 0 |
| Wheat middlings | 30. 0 |
| Wheat bran | 10. 0 |
| Dried skim milk (or dried buttermilk) | 10. 0 |
| Meat scrap | 15. 0 |
| Alfalfa-leaf meal | 10. 0 |
| Ground limestone (or oystershell) | 2. 0 |
| Salt mixture | 1. 0 |
| Cod-liver oil | 1. 0 |
| Total | 100. 0 |

ALL-MASH STARTING AND GROWING DIET

| *Ingredient* | *Parts, by weight* |
|---|---|
| Ground yellow corn | 32. 0 |
| Wheat middlings | 20. 0 |
| Wheat bran | 15. 0 |
| Dried skim milk (or dried buttermilk) | 5. 0 |
| Meat scrap | 5. 0 |
| Fish meal | 5. 0 |
| Soybean meal | 5. 0 |
| Corn gluten meal | 5. 0 |
| Alfalfa-leaf meal | 5. 5 |
| Ground limestone (or oystershell) | 1. 5 |
| Common salt (or salt mixture) | . 5 |
| Cod-liver oil | . 5 |
| Total | 100. 0 |

The salt mixture listed in these diets should consist of 100 pounds of common salt and 1.7 pounds of anhydrous manganous sulfate (or 2.5 pounds of manganous sulfate tetrahydrate). The use of this salt mixture is optional in these diets.

In feeding chicks, if a combination of mash and grain is to be used, the chicks are given a suitable starting—or starting and growing—mash, and the feeding of cracked grain is usually begun when the chicks are about 4 weeks old. Only a small amount of grain is fed at first and the quantity is gradually increased. After the chicks are about 8 weeks old, the grain is more coarsely cracked. When the all-mash method is used, the chicks may be fed a starting and growing diet until a few weeks before they are ready to lay, at which time the feed should be changed slowly to an all-mash laying diet. Another method is to use an all-mash starting diet for the first 6 to 8 weeks and then change to an all-mash growing diet. The starting mash should contain cod-liver oil or some other suitable source of vitamin D. The mash of all chickens kept in confinement should contain vitamin D.

## FEEDING HENS

Commercially mixed feeds are commonly used for feeding most small flocks. The following laying mash to be used in mash-and-grain feeding and an all-mash laying diet are taken from Farmers' Bulletin No. 1841, "The Feeding of Chickens."

LAYING MASH

| *Ingredient* | *Parts, by weight* |
|---|---|
| Wheat middlings | 32. 0 |
| Wheat bran | 20. 0 |
| Dried skim milk (or dried buttermilk) | 10. 0 |
| Meat scrap | 14. 0 |
| Alfalfa-leaf meal | 13. 0 |
| Ground limestone (or oystershell) | 6. 5 |
| Steamed bonemeal | . 5 |
| Common salt (or salt mixture) | 1. 2 |
| Cod-liver oil | 2. 8 |
| Total | 100. 0 |

ALL-MASH LAYING DIET

| *Ingredient* | *Parts, by weight* |
|---|---|
| Ground corn | 40. 0 |
| Wheat middlings | 20. 0 |
| Wheat bran | 15. 0 |
| Dried skim milk (or dried buttermilk) | 5. 0 |
| Meat scrap | 6. 5 |
| Alfalfa-leaf meal | 7. 0 |
| Ground limestone (or oystershell) | 3. 4 |
| Steamed bonemeal | . 7 |
| Common salt (or salt mixture) | 1. 0 |
| Cod-liver oil | 1. 4 |
| Total | 100. 0 |

This laying mash and most commercial mashes are used with a grain mixture of several ingredients or whole or cracked corn. The all-mash diet is fed without any other grain. The composition of the salt mixture is the same as that used in the chick diets. Inasmuch as these mashes contain all the calcium that is necessary, additional oystershell and limestone grit should not be given to the hens. Most commercial mashes contain only part of the calcium that is required; in that case it is necessary to supply additional calcium in the form of oystershell or limestone. Since some commercial mashes contain all the calcium needed it is important to follow the feeding instructions recommended by the manufacturer.

The mash-and-grain method is the one commonly used. The grain may be fed in the litter, but a more sanitary method is to feed the grain in hoppers. When grain is fed twice a day, about one-third of the total quantity is generally fed in the morning and the remainder late in the afternoon. Dry mash is fed in a hopper and is kept before the birds all the time. Plenty of feeding and drinking space is essential.

## RAISING BANTAMS

Bantams require only small coops, consume much less feed than larger birds, but lay fewer and much smaller eggs. The small size of the bantams appeals to many persons, and they are frequently kept for ornamental purposes and as children's pets. The standard breeds of bantams are miniatures of the larger breeds (fig. 11). They are described in the Department's bulletins on breeds of chickens. Adult bantams consume about 20 to 25 pounds of feed in a year. Their eggs vary in size from about 11 to 16 ounces per dozen.

19798-B

FIGURE 11.—Rose-Comb Black Bantam, male. A popular breed with many city people.

Bantams are kept in small houses and small runs. The house shown in figure 12 is small enough to be picked up by the handles and moved, together with the attached run, to fresh ground. This house is 3 feet 10 inches wide by 4 feet 6 inches deep. It is 5 feet 6 inches high in front and 4 feet 5 inches high in the rear. The attached covered run is the same width as the house and is 5 feet deep. The front of the run is 2 feet 8 inches high and, where attached to the house, 3 feet high. Such a house and run will accommodate from 6 to 10 bantam hens and a male bird. Wire-floored sun porches may be used to advantage both for raising young bantams and for mature birds (fig. 10). Wire, gravel, or cinder floors in these outside yards aid in keeping them sanitary.

## HOUSES FOR LAYING STOCK

The poultry house for the laying flock should be comfortable, light and dry, and have a good supply of fresh air but be free from drafts. The building should be on a well-drained site. It should have a southern or southeastern exposure, and the number of windows and openings and the amount of ventilation should be adapted to the climate. Frames covered with glass substitutes are used to close part or all of the openings during the winter. The open front and certain of the glass substitutes admit ultraviolet rays of the sun, which are excluded by ordinary glass windows. Glass substitutes must be kept clean and free from dust in order to admit these desirable sun rays.

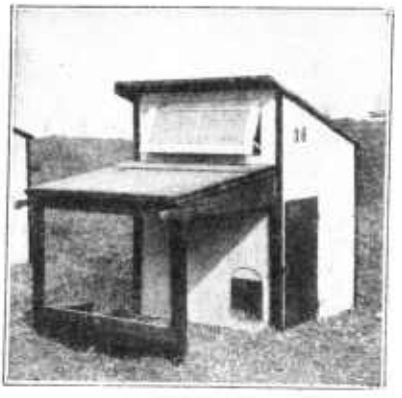

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FIGURE 12.—A convenient movable bantam house with covered run attached.

The size of the house, naturally, will be determined by the number of birds to be kept. A safe working rule is to allow about 4 square

feet of floor space per bird. The lighter birds, such as Leghorns, usually need a little less floor space than such breeds as the Plymouth Rocks, Rhode Island Reds, or Wyandottes. It cannot be said that any particular type of poultry house is the best, since local conditions determine to a large degree the type that will give good results. The poultry departments of the State colleges of agriculture are prepared to make recommendations as to the most suitable type of house for their States.

For practical purposes either a square or rectangular house is more satisfactory than those of other shapes. It should be about 6 feet

13736–C

FIGURE 13.—A good type of simple shed-roof house for a moderate-sized poultry flock in the suburbs. The dimensions are 10 feet by 12 feet by 7 feet in front and 5 feet in the rear.

high in front and at least 4½ to 5 feet high at the back. The depth of the house is a matter of importance because the deeper the house the less possibility of drafts reaching the birds when they are roosting at the rear. A depth of at least 10 feet is desirable from the standpoint of both winter and summer comfort. Ordinarily a shed-roof type of house is the most economical to build (figs. 13 and 14). Most roofs are one-fourth or less pitch, but shingle roofs should be one-third pitch.

## FLOOR

All things considered, concrete makes the most satisfactory floor since it is more sanitary and durable than any other kind. Board floors are also satisfactory and have the advantage over a concrete floor in that the house can be moved more easily to a new location. A board floor is preferable to an earth floor. If a board floor is used it should be raised at least 8 inches off the ground. The floor of the poultry house should be covered with 2 or 3 inches of litter—clean

wheat or rye straw is satisfactory. Whenever the litter gets damp and dirty it should be removed and replaced with new litter.

## INTERIOR FIXTURES

The roosts should be located at the rear of the house, away from the front openings. They should be placed about 2½ feet above the floor and should be from 13 to 15 inches apart on center. They are usually made of 2- by 4-inch or 2- by 2-inch pieces, with the corners slightly rounded. The location is shown in figures 3 and 18. Leghorns

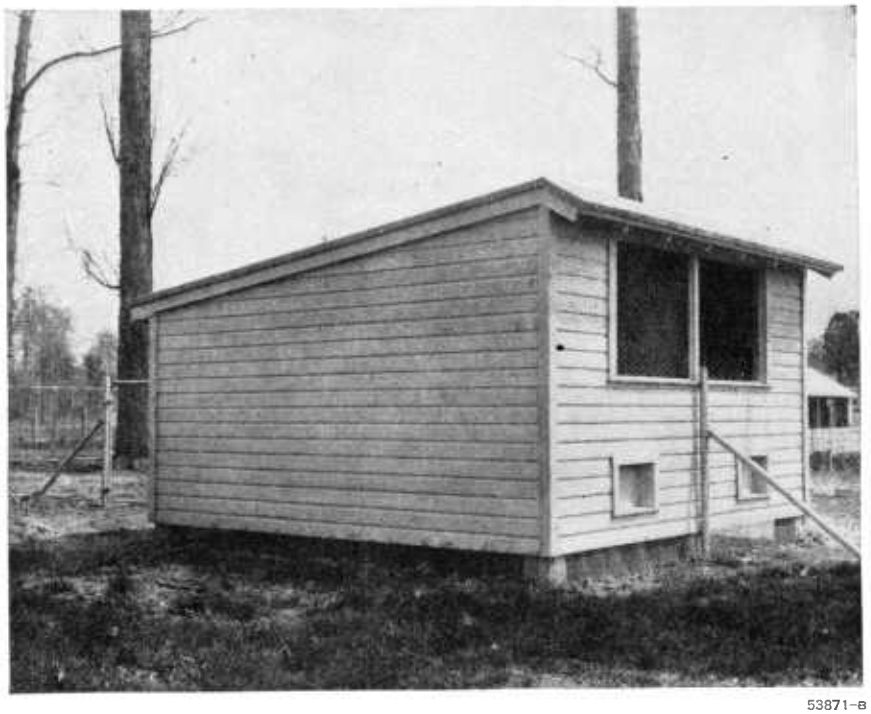

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FIGURE 14.—A shed-roof type of laying house arranged with double yards. This house is 14 feet square and 7¼ feet high in front and 5½ feet high in the rear.

require about 8 inches perch space per bird; Plymouth Rocks and similar breeds, 10 inches. The droppings board should be about 6 or 8 inches beneath the roosts and should be 20 inches wide for one roost and about 34 inches wide for two. The board may be made of matched lumber and should have a smooth surface comparatively free from cracks. It should be cleaned at least twice a week. The manure may be used as fertilizer for the flower or vegetable garden or put on the lawn, but should not be used on ground over which the chickens run.

Nests should be 12 to 14 inches square and may be placed on the end walls or on partitions. They should be high enough so that the hens can work under them. Making the back and ends of wire facilitates ventilation of the nests. Cheap nests may be made of empty orange boxes or egg crates. Nests are usually arranged in tiers (fig.

18). Provide a nest for about every four or five hens in the flock. A broody coop made with a slat or wire bottom is needed in which to confine broody hens in the spring to break up their desire to sit. This coop is also very useful for any birds which may need special attention during the year.

An open hopper so constructed and located in the laying house that the hens can help themselves to dry mash at any time is necessary for best results in egg production. One of these is shown in figure 3, and this as well as other types can be purchased in almost any poultry-supply house, or a home-made hopper can be made. Two important features of such a hopper are that it makes the dry mash easily accessible and at the same time prevents waste of feed. Hoppers may be used also for supplying grit and oystershell to the hens in the laying house, provided these minerals are not mixed with the feed.

Clean water is an important part of the hen's ration. A good-sized galvanized-iron water pail or pan is all that is necessary to hold the water supply, but it should be located about 18 inches above the floor, as shown in figure 18, in order that straw and dirt may not get into the water. The pail should be easy to empty and clean and should be protected so that the birds cannot get into the water with their feet.

## YARDS FOR LAYING STOCK

Laying hens may be kept indoors the year round, but most poultry keepers prefer to provide some outside yard space. Hens confined to the house will lay well and keep healthy provided they have comfortable, well-ventilated houses and are fed suitable rations containing cod-liver oil or some other source of vitamin D. A wire-covered outside yard or sun porch is advised. This should be about the same size as the house, with a wire, cinder, or concrete floor which keeps the chickens off the soil and is easily cleaned. For larger yards a 5- or 6-foot fence is needed, and it may be necessary to clip one wing of birds of the light breeds to keep them confined. Some poultry keepers either alternate their chicken yards with the garden plot each year or use the garden for the chickens during part of the year.

To prevent the soil from becoming contaminated, it is desirable to provide a double yard for the laying stock, so arranged that one yard can be growing a crop of green feed or grass while the other is used for the chickens (fig. 14). It is also good practice to lime the soil occasionally.

## BATTERIES FOR CHICKS

The keeping of chicks in batteries is a relatively new practice. This method is used mainly by hatcherymen and broiler producers and is particularly adapted to holding chicks for 1 to 2 weeks and raising broilers in complete confinement. Batteries are used considerably for brooding chicks and to a limited extent for keeping laying hens.

Battery brooding (fig. 15) requires regular care and good management to raise the chicks successfully. As the chicks are closely confined they are absolutely dependent on the operator. Unless conditions are kept just right, difficulties such as picking overcrowd-

ing, and leg weakness are more likely to occur in battery brooding than where the chicks have outside yards.

Feeding is extremely important in battery management as the chicks receive no sunlight and have no chance to pick up other feeds. The chicks are fed all-mash rations which include milk and minerals. Mash is kept before the chicks all the time. Fresh

48617-B

FIGURE 15.—Battery brooders for chicks.

green feed is not ordinarily supplied, but alfalfa-leaf meal is generally included in the mash as a substitute for green feed. Cod-liver oil or other sources of vitamin D must be included in the ration. The use of this oil prevents the type of leg weakness in chicks caused by lack of vitamin D and sunlight.

The all-mash starting and growing diet previously mentioned is recommended for feeding chicks in battery brooders. Chicks for broilers may be raised without any change in their ration except

omitting the cod-liver oil for 2 weeks before marketing. Additional diets suitable for feeding poultry in batteries will be found in Circular 788, Nutritive Requirements and Feed Formulas for Chickens.

Chicks' picking one another often causes great loss in battery brooding, and this habit is difficult to control. Ruby-colored light in the brooder or in the room either from colored bulbs or from stained windows, darkening the brooder room, "tipping" the upper beak of the chickens, and the use of salves and mechanical devices are some of the methods recommended for overcoming picking. Another control method is to increase the salt in the diet for 4 or 5 days, adding 0.5 percent of salt to an all-mash diet or 1 percent to the mash in a grain and mash diet. Overcrowding the chickens aggravates this

68955-B

FIGURE 16.—Batteries for laying hens. Note sloping wire floor which causes eggs to roll to the tray at the front.

habit. Because chicks grow rapidly there is a tendency to permit the batteries to become crowded. Good ventilation in the room is very essential for chicks in batteries.

## BATTERIES FOR LAYING HENS

Batteries are used to a very limited extent for laying hens (fig. 16). They enable the poultryman to know the daily egg production of each hen, making it easy to cull the poor layers as soon as they cease to be profitable. Growing pullets should be available for replacements in order to utilize the battery equipment efficiently. Pullets must have good vigor and vitality to do well in batteries. With good equipment and proper management, hens in batteries should lay approximately the same number of eggs as hens kept on the floor in well-built hen houses. Keeping each hen in a separate compartment in the batteries prevents cannibalism, which is often the cause of considerable mortality when laying flocks are kept confined.

The battery method requires considerable equipment, and the per hen investment is much greater than in the single-wall, unheated laying houses very generally used where hens are kept on the floor.

An all-mash diet is recommended for feeding laying hens in batteries. Mash is kept before the hens all the time, and feeds which are coarsely ground are preferred. Pellet feeding is being used to some extent for hens.

The use of the complete battery system, including the raising of pullets in batteries to laying age, is extremely limited and is still in the experimental stage.

## USE OF ARTIFICIAL LIGHT

Many owners of smaller flocks are using artificial lights in the laying houses to give the pullets a 12- to 14-hour day during the winter months. The use of artificial lights not only increases the

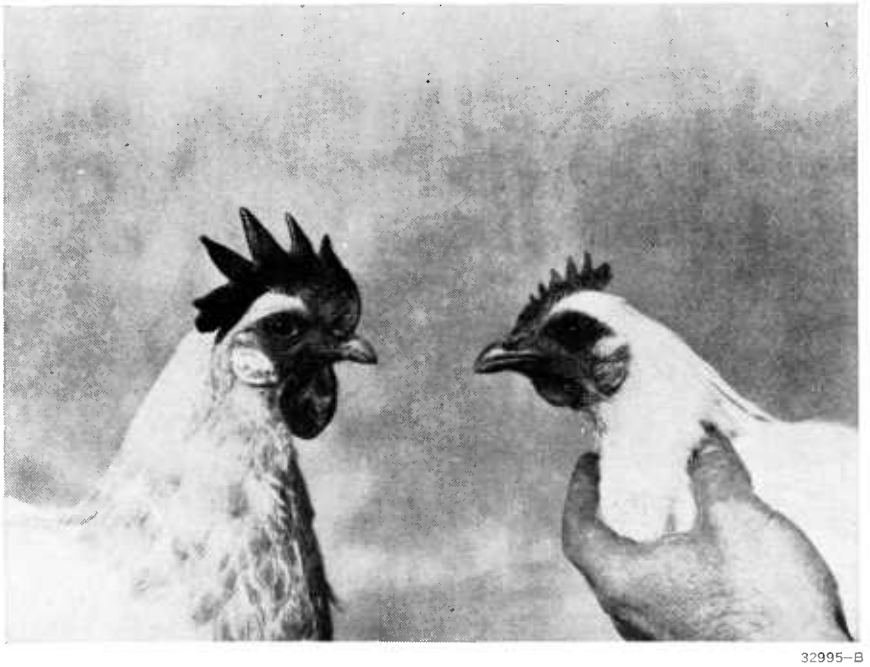

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FIGURE 17.—Appearance of the comb and wattles of a hen in laying condition (left) and one not in laying condition (right). The hen at the left laid 300 eggs in a year; the one at the right, only 55.

proportion of eggs laid during the fall and winter months when egg prices are highest but also helps to keep the birds in better condition. Usually the lights are used on the pullets only from about October 1 through February or March. Forty-watt electric lamps equipped with 16-inch reflectors are placed from 5 to 6 feet above the floor in the pens (fig. 3).

Lights may be used in the morning or both morning and evening. Automatic devices are generally used to control the light. With

evening lights some method of dimming the light is necessary to allow the hens to go onto the roosts before the lights are shut off completely. In cold weather the water should be kept from freezing during the night, if lights are used.

## SELECTING HENS FOR EGG PRODUCTION

The laying and breeding qualities of the flock can be improved by selecting the good producers and culling the poor layers. The best birds will have early maturity, good rate of production, little broodiness, and persistent production. Production during the second year is generally about 20 percent less than during the first year, so that it usually does not pay to keep hens for egg production more than 2 years. Late summer or early fall is the best time to cull the flock because at that time it is easy to distinguish the good from the poor layers. The best layers will molt late, and the yellow color will be bleached out of their shanks and beaks. The appearance of the comb and wattles and the condition of the pubic bones, abdomen, and vent are good indications of the laying condition of the hen (fig. 17). A practical way of identifying the poor birds is to mark them with different-colored bands.

## CONTROLLING DISEASES, LICE, AND MITES

The removal of sick birds from the flock is a necessary precaution against loss. In case of an outbreak of disease, consult a veterinarian or communicate with your State agricultural college, giving a complete description of the symptoms, and conditions under which the flock is kept. After the sick birds are removed from the flock, thoroughly clean and disinfect (fig. 18) the poultry house and all feeding and watering equipment. If treatment of sick birds is advisable, keep them confined while being treated. In many cases, in an outbreak of disease, it is better to kill the affected birds and burn or bury them deeply. The Department has published a bulletin on poultry diseases (Farmers' Bulletin 1652), which describes the symptoms of diseases and suggests methods of prevention and treatment.

Sanitation is a very important factor in keeping down diseases and parasites in poultry flocks. Land used for poultry should be kept free from contamination. Some poultrymen lime their soil annually. The poultry house should be kept clean and the floor well covered with clean, dry litter. Comfortable, well-ventilated and well-lighted houses, free from drafts or dampness, should be provided.

The floor of the poultry house should be scraped and the house thoroughly cleaned and disinfected at least once a year. Mites may be eradicated by using a suitable insecticide, such as anthracene oil, on the roosts, roost supports, and nest boxes. This may be painted on with a brush, or it may be diluted with an equal quantity of kerosene and used as a spray. Crude petroleum is cheaper but less effective. The under part of the roosts should be examined for mites every week or two in warm weather and less frequently in cold weather. The birds should be examined and, if lice are present, all the birds should be treated with a good insecticide. One of the best of these is commercial sodium fluoride, and a small pinch of it should be rubbed into the feathers of the head, neck, back, breast, each thigh, below each wing, at the tail head, and under the vent (fig. 19). A simpler treat-

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FIGURE 18.—Thorough cleaning and spraying help to keep the poultry house sanitary so that the chickens will be healthy and free from insect pests. Note the windows below the roosts and the opening under the roof to provide extra ventilation. Arranging the nests in tiers on the wall at the right allows for cleaning the floor beneath. The rack near the nests is for the water pail.

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FIGURE 19.—Pinch method of applying sodium fluoride to a fowl infested with lice.

ment for lice is to apply a thin ribbon of a 40-percent solution of nicotine sulphate on the top of the roosts just before the birds go onto the roosts.

## RECORD KEEPING

Owners of small flocks usually like to keep records of returns and expenses of their poultry flocks. The most essential records are the daily egg production, a cash account of receipts and expenses, and a yearly inventory. Estimated values of poultry meat and eggs used in the household should be included in the receipts.

## FINISHING CHICKENS FOR THE TABLE

If there is a special market for dressed fowls it may pay the grower to feed a fattening ration to the birds that are selected for the purpose. Ordinarily there is not much to be gained by small-flock owners attempting to finish or fatten their chickens before they market them, especially if they are in good condition as a result of having been raised on well-balanced diets. However, considerable weight may be gained by healthy chickens that are not in good flesh by feeding them liberally on a suitable diet.

In finishing young cockerels for broilers it is necessary to feed more protein than in feeding older birds because the cockerels are still growing. They will make the best gains if placed in small pens and fed a mash moistened to a crumbly consistency with milk or buttermilk, two or three times a day. The first few feedings should be relatively light, but beginning with the last feeding on the second day the chickens may be given all the wet mash they will eat in half an hour.

The appearance and condition of dressed poultry depend greatly on the care used in the killing, packing, and cooling. Chickens should be dressed preferably when the weather is cool, when the birds are to be used soon, or when it will take only a few hours to reach the market. No solid food should be given the chickens for 24 hours before killing, but plenty of water should be supplied.

Market fowls may be either scalded and picked or dry-picked after being killed. Scalding is the easier method. Dry picking is more difficult, but it results in a much more attractive fowl, which may sell more readily on some markets. The dry-picking method also requires a special method of killing the bird by cutting the jugular vein in the back of the mouth and sticking the knife blade into the brain through the roof of the mouth.

## HOME METHODS OF PRESERVING EGGS

During the spring and early summer, when eggs are abundant and reasonable in price, they may be preserved for winter use. Fresh eggs properly preserved may be kept for 6 to 9 months and used with good results. Those laid during March, April, and May usually keep better than eggs laid later in the season.

Only fresh eggs with sound, strong shells should be preserved, and any eggs which are soiled, cracked, or even slightly checked should not be used. For 14 to 15 dozen medium-sized eggs, use 1 quart of water glass to 9 quarts of water that has been boiled and cooled. Measure the water into a 5-gallon crock or galvanized can which has

been thoroughly cleaned and scalded. Add the water glass and stir the mixture thoroughly. Place the eggs in the water-glass solution, and be careful to have at least 1 inch of the solution covering the eggs at all times. If there are not enough eggs on hand when the solution is first made, more eggs may be added from time to time. Keep the solution containing the preserved eggs in a cool, dry place. The container should be tightly covered to prevent evaporation.

Eggs may also be preserved in limewater obtained by slaking 2 pounds of lime in water and mixing the clear solution with 5 gallons of boiled water. The use of galvanized containers is not advised for the limewater solution.

The eggs should be removed from the preservative only as needed for immediate use and should be washed to remove the coating which covers the shell. When eggs preserved in water glass are to be boiled, a small hole should be made in the shell with a pin at the large end to allow the air in the egg to escape.

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